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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,279	04/20/2001	Fumio Mikami	35.G2787	9115

5514 7590 05/04/2005

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EXAMINER

HUNTSINGER, PETER K

ART UNIT PAPER NUMBER

2624

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/838,279

Applicant(s)

MIKAMI, FUMIO

Examiner

Peter K. Huntsinger

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Amendment

1. The amendment filled on 1 March 2005 has been entered in full.
2. The amendments to the specification filled on 10 March 2005 have been accepted.
3. Based on the applicant's amendment, the 35 U.S.C. § 112, first paragraph rejection to claim 29 has been withdrawn.

Response to Arguments

4. Applicant's arguments filed 1 March 2005 have been fully considered but they are not persuasive.

Applicant argues, on pages 10 and 11 of the remarks, that:

Hayashi does not disclose a plurality of density correcting table groups, each comprising a plurality of correcting tables

- a. Hayashi discloses generating tonality correction tables according to specific characteristics required (col. 14, lines 24-30). Hayashi gives the examples of correction tables to limit the yellow component and correction tables corresponding to when thin sheets are used. These correction tables constitute groups because according to the definition of a group, they are things considered together because of similarities. Further, a specific definition of a group is not disclosed by the applicant's specification. Hayashi discloses that these tonality transform tables are stored in the ROM as opposed to always generating the tables (col. 10-11, lines 64-67, 1-3).

Applicant argues, on pages 11-14 of the remarks, that:

The test print 1 of Takahashi is used to determine a correction coefficient of contrast potential for image formation and is not used to set test correction tables for making densities of an image to be recorded by plural recording elements uniform

b. Takahashi disclose that after obtaining the densities of test print 1, the density nonlinearity is corrected by changing the maximum density value (col. 12, lines 18-26). Eliminating the nonlinearity would make the densities of the correction tables more uniform.

Applicant argues, on page 14 of the remarks, that:

There is no disclosure or suggestion that the ultimate recording correction tables would be determined from among first and second table groups if Hayashi were modified with the teachings of Takahashi

c. Takahashi disclose that the correction tables are determined from the first group of tables formed from the first test print (S102 of Fig. 9, col. 11-12, lines 44-67, 1-7) and the second group of tables formed from the second test print (S106 of Fig. 9, col. 13, lines 40-62), which satisfies the claim limitation.

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 21-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Hayashi.

Referring to claim 21, Hayashi discloses a recording apparatus for performing binary recording on a recording medium by controlling binarizing means for binarizing input multi-level data and driving recording heads, each recording head comprising a plurality of recording elements, according to a binary signal output by the binarizing means (col. 9, lines 38-42), said apparatus comprising: a plurality of density correcting table groups for correcting input multi-level image data (Fig. 5, col. 9, lines 58-65), the density correcting table groups each comprising a plurality of correcting tables, each having a different correction amount and having different correction characteristics from each other (Fig. 6, col. 9-10, lines 66-67, 1-4); means for selecting one density correcting table group from the plurality of density correcting table groups (Fig 6., col. 10, lines 4-6); and correcting means for correcting multi-level data by associating the multi-level data correspond with a correcting table with a correcting table from the selected correcting table group according to a pixel address of a corresponding recording head for each pixel (S18 of Fig. 9B, col. 13, lines 46-51).

Referring to claim 22, Hayashi discloses an apparatus according to claim 21, wherein in said means for selecting the one density correcting table group from the plurality of density correcting table groups, selection input is performed by a user (col. 13, lines 55-59). In the apparatus of Hayashi, the user can select either the correction tables as generated in Fig. 9, or can select the original correction tables.

Referring to claim 23, Hayashi discloses an apparatus according to claim 21, wherein one correcting table group of the plurality of correcting table groups comprises correcting tables having correction characteristics which differ from correction characteristics of correcting tables of another correcting table group at different density levels (S2 and S3 of Fig. 5, col. 9, lines 58-65).

Referring to claim 24, Hayashi discloses an apparatus according to claim 21, further comprising means for generating the multi-level data by reading a document (S12 of Fig. 9B, col. 13, lines 36-44).

Referring to claim 25, Hayashi discloses an apparatus according to claim 21, wherein the recording elements comprise light emitting elements (LD 454 of Fig. 4, col. 9, lines 44-49).

Referring to claim 26, Hayashi discloses an apparatus according to claim 25, wherein the light emitting elements comprise LED elements (LD 454 of Fig. 4, col. 9, lines 44-49).

Claim Rejections - 35 USC § 103

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3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5 and 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi in view of Takahashi.

Referring to claim 1, Hayashi discloses a recording apparatus for recording an image on a recording medium by using a recording head in which a plurality of recording elements are arranged (image forming apparatus of Fig. 1), said apparatus comprising: memory means for storing a first table group for correcting input multi-level image data (ROM 103 of Fig. 1, col. 10-11, lines 64-67, 1-3), the first table group comprising a plurality of first correction tables, each first correction table having a different degree of correction, and a second table group comprising a plurality of second correction tables having correction characteristics which are different from correction characteristics of the first table group with respect to different density levels (S2 and S3 of Fig. 5, col. 9, lines 58-65); first forming means for forming a first test pattern by the plurality of recording elements at a predetermined density (S11 of Fig. 9, col. 13, lines 2-6); first setting means for setting test correction tables for making the densities of an image to be recorded by the plurality of recording elements uniform by associating first correction tables of the first table group with respective recording elements of the plurality of recording elements based on a result of reading the densities of areas of the first test pattern that correspond to the plurality of recording elements (S18 of Fig. 9, col.

13, lines 46-51). Hayashi does not expressly disclose a forming a second test pattern and setting the recording tables based on the second test pattern. Takahashi discloses second forming means for forming a second test pattern having a plurality of different density levels, the second test pattern being recorded with the recording elements being corrected by the test correction tables set by said first setting means (S105 of Fig. 9, col. 13, lines 36-43); and second setting means for setting recording correction tables corresponding to each of the plurality of recording elements based on the second test pattern, the recording correction tables being determined from among the first table group and the second table group (S107 of Fig. 9, col. 13, lines 59-62). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to form a second test pattern and set the recording tables based on the second test pattern according to the disclosure of Takahashi. One of ordinary skill in the art would have been motivated to do this to further improve the image quality of a document by reducing the non-uniformities of image density.

Referring to claim 2, Hayashi discloses an apparatus according to claim 1, further comprising selection means for selecting the recording correction tables by a user judging the second test pattern (col. 13, lines 55-59). In the apparatus of Hayashi, the user can select either the correction tables as generated in Fig. 9, or can select the original correction tables.

Referring to claim 3, Hayashi discloses an apparatus according to claim 1, wherein the second table group comprising the plurality of second correction tables comprises a first table for higher density levels and a second table for lower density

levels, the second table having a degree of correction different from a degree of correction of the first table (S2 and S3 of Fig. 5, col. 9, lines 58-65).

Referring to claim 4, Hayashi discloses an apparatus according to claim 1, wherein the recording elements comprise light emitting elements (LD 454 of Fig. 4, col. 9, lines 44-49).

Referring to claim 5, Hayashi discloses an apparatus according to claim 4, wherein the light emitting elements comprise LED elements (LD 454 of Fig. 4, col. 9, lines 44-49).

Referring to claim 9, Hayashi discloses an apparatus according to claim 1, further comprising reading means for reading recorded images (S12 of Fig. 9B, col. 13, lines 36-44).

Referring to claim 10, Hayashi discloses an apparatus according to claim 9, wherein said first setting means sets the test correction tables based on a result of reading the first test pattern by said reading means (S18 of Fig. 9B, col. 13, lines 36-51).

Referring to claim 11, the combination of Takahashi and Hayashi disclose an apparatus according to claim 1, further comprising third forming means for forming a third test pattern having the plurality of different density levels, the third test pattern being recorded by recording elements uncorrected by any correction table, wherein said second setting means sets the recording correction tables based on a comparison of the second test pattern and the third test pattern. Hayashi discloses comparing the uncorrected test pattern correction tables with the modified correction tables (col. 13,

lines 55-59). Because the third test pattern is uncorrected by any correction table, it is equivalent to the uncorrected first test pattern of Hayashi. Hayashi does not disclose printing a test pattern of the modified correction tables. Takahashi discloses printing a test pattern of density modified correction tables (S105 of Fig. 9, col. 13, lines 36-43). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the printing of a test pattern of modified correction tables of Takahashi with the comparison between original and modified correction tables of Hayashi. One of ordinary skill in the art would have been motivated to do this to allow the user to view the printed original and modified correction tables before decided to which correction tables to utilize.

Referring to claim 12, Hayashi discloses an apparatus according to claim 11, wherein the comparison of the second and third test patterns is performed by a user (col. 13, lines 55-59). In the apparatus of Hayashi, the user can select either the correction tables as generated in Fig. 9, or can select the original correction tables.

Referring to claim 13, Hayashi discloses an apparatus according to claim 11, further comprising reading means for reading recorded images and comparing means for comparing densities of read images, wherein said reading means reads the second and third test patterns (S12 of Fig. 9B, col. 13, lines 36-44) and the comparison of the second and third test patterns is performed by said comparing means comparing data read by said reading means (col. 13, lines 55-59). In the apparatus of Hayashi, the user can select either the correction tables as generated in Fig. 9, or can select the original correction tables.

Referring to claim 14, Hayashi discloses a method for correcting nonuniformities in the density of an image recorded by a recording head having a plurality of recording elements arranged therein, said method comprising the steps of: forming a first test pattern by the plurality of recording elements at a predetermined density (S11 of Fig. 9, col. 13, lines 2-6); setting, in a first setting step, test correction tables for making the densities of an image to be recorded by the plurality of recording elements uniform by associating first correction tables, which are from among a first table group for correcting input multi-level image data, with respective recording elements of the plurality of recording elements based on a result of reading densities of areas of the first test pattern that correspond to the plurality of recording elements (S18 of Fig. 9, col. 13, lines 46-51) and recording correction tables being determined from among the first table group and a second table group comprising second correction tables having correction characteristics which are different from correction characteristics of corresponding first correction tables of the first table group with respect to different density levels (S2 and S3 of Fig. 5, col. 9, lines 58-65). Hayashi does not expressly disclose a forming a second test pattern and setting the recording tables based on the second test pattern. Takahashi discloses forming a second test pattern having a plurality of different density levels, the second test pattern being recorded with the recording elements being corrected by the test correction tables set in said first setting step (S105 of Fig. 9, col. 13, lines 36-43); and setting, in a second setting step, recording correction tables corresponding to each of the plurality of recording elements based on the second test pattern (S107 of Fig. 9, col. 13, lines 59-62). At the time the invention was made, it

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would have been obvious to a person of ordinary skill in the art to form a second test pattern and set the recording tables based on the second test pattern according to the disclosure of Takahashi. One of ordinary skill in the art would have been motivated to do this to further improve the image quality of a document by reducing the non-uniformities of image density.

Referring to claim 15, Hayashi discloses a method according to claim 14, further comprising a step of selecting the recording correction tables by a user judging the second test pattern (col. 13, lines 55-59). In the apparatus of Hayashi, the user can select either the correction tables as generated in Fig. 9, or can select the original correction tables.

Referring to claim 16, Hayashi discloses a method according to claim 14, wherein the second table group comprising the plurality of second correction tables comprises a first table for higher density levels and a second table for lower density levels, the second table having a degree of correction different from a degree of correction of the first table (S2 and S3 of Fig. 5, col. 9, lines 58-65).

Referring to claim 17, Hayashi discloses a method according to claim 14, further comprising a step of reading recorded images, wherein said first setting step sets the test correction tables based on a result of reading the first test pattern in said reading step (S12 of Fig. 9B, col. 13, lines 36-44).

Referring to claim 18, Takahashi and Hayashi discloses a method according to claim 14, further comprising a third forming step of forming a third test pattern having the plurality of different density levels, the third test pattern being recorded by recording

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elements uncorrected by any correction table, wherein said second setting step sets the recording correction tables based on a comparison of the second test pattern and the third test pattern. Hayashi discloses comparing the uncorrected test pattern correction tables with the modified correction tables (col. 13, lines 55-59). Because the third test pattern is uncorrected by any correction table, it is equivalent to the uncorrected first test pattern of Hayashi. Hayashi does not disclose printing a test pattern of the modified correction tables. Takahashi discloses printing a test pattern of density modified correction tables (S105 of Fig. 9, col. 13, lines 36-43). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the printing of a test pattern of modified correction tables of Takahashi with the comparison between original and modified correction tables of Hayashi. One of ordinary skill in the art would have been motivated to do this to allow the user to view the printed original and modified correction tables before decided to which correction tables to utilize.

Referring to claim 19, Hayashi discloses a method according to claim 18, wherein the comparison of the second and third test patterns is performed by a user (col. 13, lines 55-59). In the apparatus of Hayashi, the user can select either the correction tables as generated in Fig. 9, or can select the original correction tables.

Referring to claim 20, Hayashi discloses a method according to claim 18, further comprising a step of reading recorded images and a step of comparing densities of read images, wherein said reading step reads the second and third test patterns (S12 of Fig. 9B, col. 13, lines 36-44) and the comparison of the second and third test patterns is

performed by said comparing step comparing data read in said reading step (col. 13, lines 55-59). In the apparatus of Hayashi, the user can select either the correction tables as generated in Fig. 9, or can select the original correction tables.

5. Claims 6-8 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi and Takahashi as applied to claims 1, 6, 21, 27, and 28 above, and further in view of Matsumoto et al.

Referring to claim 6, the combination of Hayashi and Takahashi disclose the apparatus according to claim 1, but do not expressly disclose recording utilizing an ink jet head. Matsumoto et al. discloses an apparatus wherein the recording head is an ink jet head for recording by ejecting ink from a plurality of nozzles in response to driving of the recording elements (ink-jet printing apparatus of Fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the imaging forming system of Takahashi and Hayashi with an ink jet printer. One of ordinary skill in the art would have been motivated to do this to allow an ink jet printer to correct density values and print higher quality documents.

Referring to claim 7, the combination of Hayashi and Takahashi disclose the apparatus according to claim 1, but do not expressly disclose recording utilizing an ink jet head with electrothermal converters. Matsumoto et al. discloses an apparatus according to claim 6, wherein the recording elements comprise electrothermal converters for applying thermal energy to ink (col. 32, lines 40-50).

Referring to claim 8, the combination of Hayashi and Takahashi disclose the apparatus according to claim 1, but do not expressly disclose recording utilizing an ink jet head with piezoelectric converters. Matsumoto et al. discloses an apparatus according to claim 6, wherein the recording elements comprise piezoelectric converters for ejecting the ink (col. 33, lines 59-64).

Referring to claim 27, Hayashi discloses the apparatus according to claim 21, but does not expressly disclose recording utilizing an ink jet head. Matsumoto et al. discloses an apparatus according to claim 21, wherein the recording head is an ink jet head for recording by ejecting ink from a plurality of nozzles in response to driving of the recording elements (ink-jet printing apparatus of Fig. 1).

Referring to claim 28, Hayashi discloses the apparatus according to claim 21, but does not expressly disclose recording utilizing an ink jet head with electrothermal converters. Matsumoto et al. discloses an apparatus according to claim 27, wherein the recording elements comprise electrothermal converters for applying thermal energy to ink (col. 32, lines 40-50).

Referring to claim 29, Hayashi discloses the apparatus according to claim 21, but does not expressly disclose recording utilizing an ink jet head with piezoelectric converters. Matsumoto et al. discloses an apparatus according to claim 28, wherein the recording elements comprise piezoelectric converters for ejecting the ink (col. 33, lines 59-64).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

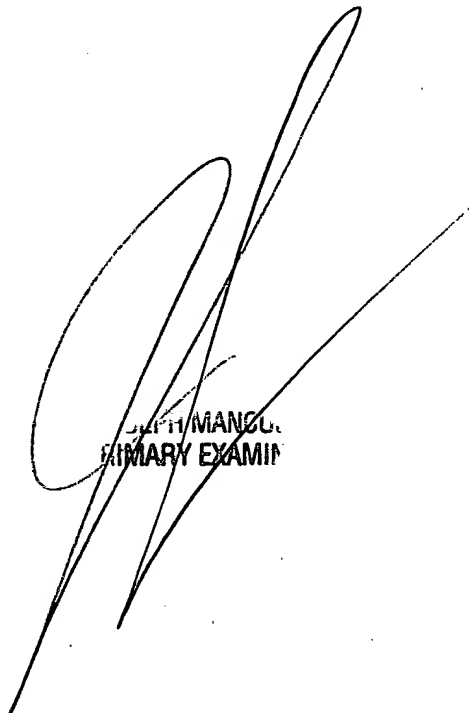
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter K. Huntsinger whose telephone number is (571)272-7435. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on (571)272-7437. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PKH



JOSEPH MANGANO
PRIMARY EXAMINER